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EXAMINER

SHIFERAW, ELENI A

ART UNIT

PAPER NUMBER

2436

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/715,824	Applicant(s) TURPIN, TERRY M.	
	Examiner ELENI A. SHIFERAW	Art Unit 2436	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/11/2008 has been entered.

2. Claims 1-16 are pending.

Response to Amendment

3. The abandonment of copending application No. 11632635 has been noticed in response to provisional type double patenting (DP) rejection, and the rejection to DP has been withdrawn.

4. No amendment has been done on 9/11/08 with the filing of RCE.

Response to Amendment on 9/11/08

Regarding argument there is no teaching or suggestion in Jackson of dividing an optical signal into a first plurality of spectral sub-bands and the 3/12/08 Office Action fails to identify those teachings, remark page 3 par. 2 and page 4 par. 3, argument is not persuasive because Jackson teaches a method of imprinting a package of digital data on a

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carrier light beam by using two-dimensional spatial light modulator and securing the light beam/analogue optical signal by encrypting it (see col. 3 lines 46-64 and abstract), Jackson also teaches a first electronic device electronically connected to a first spatial light modulator operating to split the first serial digital data stream into a first portion and a second portion and a combiner operating to combine the first portion of said first serial digital data stream and the encrypted serial digital data stream (see claim 21) that reads on dividing optical signal into first plurality of sub-bands. Moreover the 3/12/08 Office Action discloses this limitation on page 4 par. 5 lines 6-7 and page 3 lines 9-13.

Regarding argument there is no teaching or suggestion in Jackson of modifying each of a first plurality of spectral sub-bands to encrypt information contained in an optical signal, remark page 3 par. 3, argument is not persuasive because Jackson discloses modifying the signals data and encrypting the signals see abstract, col. 4 lines 11-49, and col. 11 lines 9-54 and this limitation is addressed by the examiner on the Office Action mailed on 3/12/08 page 4 par. 5 lines 8-9.

Regarding argument there is no teaching or suggestion in Jackson of combining a modified first plurality of spectral sub-bands into a combined optical signal, remark page 3 par. 4, argument is not persuasive because see claims 17-18 that teaches combining the modified signals data. Moreover the 3/12/08 Office Action discloses this limitation on page 5 lines 1-2.

Regarding argument there is no teaching or suggestion in Jackson of dividing a combined optical signal into a second plurality of spectral sub-bands, remark page 3 par. 5, and argument is not persuasive because Jackson discloses dividing the signal, modifying the divided signals to encrypt and combining them as discloses above. Jackson further discloses dividing the combined signal see claims 17-18, col. 9 lines 65-col. 10 lines 4 and col. 11 lines 21-28 as also disclosed on the 3/12/08 Office Action page 5 lines 3-4.

Regarding argument Jackson failure to teach modifying each of a second plurality of spectral sub-bands to decrypt previously encrypted information contained in an optical signal, remark page 4 par. 2, argument is not persuasive because modifying each second plurality of signals and encrypting is disclosed on claim 16 and col. 4 lines 11-19.

Regarding argument Jackson failure to address claim 9 for similar reasons as claim on, remark page 5 par. 1, argument is not persuasive for similar reasons above.

Response to Amendment 3/12/08

Regarding applicant argument wherein "reflective/transmissive architecture" and/or "secure transmission of an information containing optical signal in a reflective/transmissive architecture" not being disclosed or suggested by Jackson, as recited in claim 1, remark page 9 par. 3, argument is not persuasive because:

See col. 8 lines 37-67 and col. 1 lines 11-16 that discloses a beam reflecting element 306 that reflects and transmits analog optical sensitive signal securely over network; and the argued subject matter above is clearly disclosed as shown.

However if applicant's argument was correct and argued limitation was not taught by the applied references, the recitation, "reflective/transmissive architecture", would not have been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding applicant's argument Jackson failure to disclose "imparting a time delay to each sub-band and imparting a frequency shift to each sub-band" as recited in dependent claims 6-7, and 16, remark page 9 lines 13-16, argument is not persuasive because as applicant agreed Jackson for disclosing "imparting phase shift" on page 9 line 16 of the remark, the claims (6-7, and 16) are satisfied and/or applicant's claims are listed as "... *at least one of* ...".

Regarding argument wherein Jackson failure to disclose " 'sub-bands' " of data spectrum" as recited in claims 1 and 9, remark page 9 lines 16-23, argument is not

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persuasive because Jackson teaches an analog optical signal security system (see abstract), and a spatial light modulator splitting a first serial optical digital data stream into a first portion and a second portion (see claim 21) that reads on spectral sub-bands.

Regarding arguments applicant's invention disclosing "1-D system and a multiplicity of 1D systems in a 2-D arrangement", "not requiring a hologram", "not requiring a readout laser" and "serial data processing" unlike to Jackson, remark last par. of page 9- first par. of page 10, argument is not persuasive because they are not claimed and/or these features of applicant's invention are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The rejection, for claims 2-5 and 9-16, is respectfully maintained for the same reasons above.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson 5793871.

Regarding claim 1, Jackson discloses a method for secure transmission of an information-containing optical signal in a reflective/transmissive architecture (fig. 2-5, col. 8 lines 37-67 and col. 1 lines 11-16), comprising:

dividing the optical signal into a first plurality of spectral sub-bands (claim 21, and col. 3 lines 46-64),

modifying each of the first plurality of spectral sub-bands to encrypt the information contained in the optical signal (abstract, col. 4 lines 11-49, and col. 11 lines 9-54),

combining the modified first plurality of spectral sub-bands into a combined optical signal (claim 17-18, and col. 11 lines 21-28),

dividing the combined optical signal into a second plurality of sub-bands (claim 17-18, col. 9 lines 65-col. 10 lines 4, and col. 11 lines 21-28),

modifying each of the second plurality of spectral sub-bands to decrypt the previously encrypted information contained in the optical signal (claim 16, and col. 4 lines 11-19).

Regarding claim 6 Jackson discloses the method wherein at least one of the steps of modifying each of the first plurality of spectral sub-bands and modifying each of the second plurality of spectral sub-bands comprises at least one of imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift

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to each sub-band (col. 9 lines 45–col. 10 lines 4).

Regarding claim 7 Jackson teaches the method comprising at least one of imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each sub-band at a rate that changes over time (col. 9 lines 45–col. 10 lines 4).

Regarding claim 8 Jackson teaches the method comprising imparting a frequency shift to the input information-containing optical signal (fig. 2-5).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson 5793871 in view of Chen et al. 7146109 B2.**

Regarding claim 9 discloses a system for secure transmission of an information-containing optical signal (fig. 2-5), comprising:

to enable division of the optical signal into a first plurality of spectral sub-bands (claim 21, and col. 3 lines 46-64),

at least a first phase modulator configured to enable modification of each of the first plurality of spectral sub-bands to encrypt the information contained in the optical signal (abstract, col. 4 lines 11-49, and col. 11 lines 9-54), to enable combining the modified first plurality of sub-bands into a combined optical signal (claim 17-18, and col. 11 lines 21-28),

to enable division of the combined optical signal into a second plurality of spectral sub-bands (claim 17-18, col. 9 lines 65-col. 10 lines 4, and col. 11 lines 21-28),

at least a second phase modulator configured to enable modification of each of the second plurality of spectral sub-bands to decrypt the information previously encrypted, to enable combining the modified second plurality of sub-bands into a combined optical signal (claim 16, and col. 4 lines 11-19). Jackson fails using optical tapped delay line. However Chen discloses an optical modulation signal transmission based on optical tapped delay line (col. 3 lines 53-67). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teachings of Chen et al. within Jackson because they are analogous in optical data transmission. One would have been motivated to incorporate the teachings because it would spatially resolve the wavelengths in an optical signal based on tapped optical delay signal.

Regarding claim 10 the combination discloses the system comprising: at least a third OTDL configured to enable division of each of the first plurality of spectral sub-bands into a plurality of finer sub-bands, and wherein at least the first phase modulator is configured to enable modification of each of the plurality of finer spectral sub-bands to

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encrypt the information contained in the optical signal (Chen et al. col. 3 lines 53-67 and fig. 4-5, and Jackson col. 4 lines 11-49, and col. 11 lines 9-54)

Regarding claim 11, Jackson teaches the system wherein at least one of the first and second phase modulator comprises a reflective phase modulating array (fig. 4-5).

Regarding claim 12, Jackson teaches the system wherein at least one of the first and second phase modulator comprises a transmissive phase modulating array (fig. 4-5).

Regarding claim 13, Jackson teaches the system comprising at least one computer for controlling at least one of modification of the first plurality of sub-bands by the first phase modulator and modification of the second plurality of sub-bands by the second phase modulator (col. 3 lines 32-45).

Regarding claim 14, wherein at least one of the first and second phase modulator comprises at least one of a liquid crystal array, a micro electromechanical system device, an array of III-V or II-VI semiconductor devices, the examiner takes an official notice as a well known in the art at the time of the invention (see Towler et al. USPN 6045715 col. 1 lines 11-20, and Bloom et al. 5311360 col. 3 lines 10-29). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teachings because they are analogous in optical signal transmission. One would have been motivated to do so because it would low cost display application.

Regarding claim 15, the combination discloses the system wherein at least a first pair of OTDL configured to enable division of the optical signal into a first plurality of sub-bands (Chen et al. fig. 4, and Jackson claim 21, and col. 3 lines 46-64), at least a second pair of OTDL configured to enable division of the combined optical signal into a second plurality of spectral sub-bands, wherein at least one of the first and second phase modulator comprises a transmissive phase modulating array (Jackson fig. 4-5, and Chen et al. col. 3 lines 46-64). The rationale for combining are the same as claim 9 above.

Regarding claim 16, Jackson discloses the system wherein the first phase modulator is configured to enable modification of each of the first plurality of sub-bands by at least one of imparting a phase shift to each spectral sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each spectral sub-band, and wherein the second phase modulator is configured to enable modification of each of the second plurality of sub-bands at least one of imparting a phase shift to each spectral sub-band, imparting a time delay to each spectral sub-band, and imparting a frequency shift to each sub-band (col. 9 lines 45–col. 10 lines 4).

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson 5793871 in view of USPN Krause 4448529.

Regarding claim 2, Jackson fails to disclose wherein the information-containing optical signal has a bandwidth and at least one of the first and second plurality of sub-bands has

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a sub-band resolution at least 50 times finer than the bandwidth of the information-containing optical signal. However Krause teaches having many large number of spaces or optical transmitting regions in order to achieve a good resolution (see col. 6 lines 37-53, col. 9 lines 54-63, col. 10 lines 19-29, and col. 8 lines 46-53). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the teachings of Krause within the system of Jackson because they are analogous in optical data transmission. One would have been motivated to do so because it would make high resolution.

10. Claims 3 and 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson 5793871 in view of Young et al. 20060291859 A1.

11. Regarding claim 3 Jackson fails to disclose how information-containing optical signal is transmitted at a bit rate. However Young et al. discloses a method wherein the information-containing optical signal is transmitted at a bit rate of not less than 1 gigabit per second (par. 0005). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teachings of Young et al. within the system of Jackson et al. because they are analogous in optical data transmission. One would have been motivated to incorporate the teachings because it was well known at the time of the invention to transmit optical data at a bit rate of not less than 1 gbps for faster transmission.

Regarding claim 4, Young et al. teaches the method wherein the information-containing

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optical signal is transmitted at a bit rate of not less than 10 gigabits per second (Young et al. par. 0005), and the examiner takes an official notice wherein at least the first plurality of sub-bands comprise not less than 50 sub-bands and wherein at least the first plurality of spectral sub-bands has a spatial resolution at a focal plane of not greater than 200 MHz because it is well known at the time of the invention.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson 5793871 in view of Soref et al. 6114994.

Regarding claim 5, Jackson et al. does not teach sub-bands not less than 100. However Soref et al. discloses the method wherein the first plurality of sub-bands comprise not less than 100 sub-bands (claim 4b; optical modulator dividing input data into n spectral sub-bands). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teachings because it would n spectral sub-bands more than 100 for secure transmission.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is advised to look at these references, 2003/0128845, 6,380,547 and 4,359,736, for disclosing for most of argued subject matters to name a few.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eleni A. Shiferaw whose telephone number is 571-272-3867. The examiner can normally be reached on Mon-Fri 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser R. Moazzami can be reached on (571) 272-4195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eleni A Shiferaw/
Examiner, Art Unit 2436